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**REMARKS**

Claims 1-13 are pending in the present application.

**I. Rejection of Claims 9 and 10 under 35 U.S.C. §102(b) over Tarjan**

Claims 9 and 10 have been rejected under 35 U.S.C. §102(b) as being anticipated by Tarjan (US-A-4,787,389). This rejection of claims 9 and 10 under 35 U.S.C. §102(b) over Tarjan is respectfully traversed.

As respectfully submitted above, amended independent claim 9 sets forth a signaling system for a two-module implantable cardiac assist system having a main module and an auxiliary module, the main module having a lead system to transmit pacing signals to a heart and to receive signals representing sensed characteristics of the heart, the auxiliary module having a fixed-mode pacing circuit and a lead system to transmit fixed-mode pacing signals to the heart. The signaling system, comprises signaling means in the main module for generating a signal to the auxiliary module, said signal representing that the main module has ceased transmitting pacing signals to the heart; sensing means in the auxiliary module, in response to the signal from said signaling means, for determining if the auxiliary module should activate; and a switch to activate the auxiliary module to generate the fixed-mode pacing signals when the sensing means determines that the signal from said signaling means indicates that the auxiliary module should activate.

In formulating the present rejection under 35 U.S.C. §102(b), the Examiner alleges that Tarjan teaches a main module which can communicate via electrodes with an auxiliary module and switches which active the auxiliary module to enable it to then send a defibrillation pulse to the heart. From these allegations, the Examiner concludes that the presently claimed invention is anticipated by Tarjan. These positions by the Examiner are respectfully traversed in view of the claims presented above.

Tarjan teaches to modules that are used in assisting a heart to properly function. One module provides pacing to the heart, while the other module provides a defibrillation signal to the heart. Tarjan further teaches that before providing the defibrillation signal to the heart, the defibrillation module sends a pulse coded signal to the pacing module so that the pacing module can open a set switches so as to isolate the pacing module from the electrical signal produce during defibrillation.

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Tarjan fails to teach that a main module, which provides pacing signals to a heart, sends a signal to a second module, as set forth in amended independent claim 9. Moreover, Tarjan fails to teach that an auxiliary module, which provides fixed-rate mode pacing signals to a heart, receives a signal from the main module wherein the signal represents that the main module has ceased transmitting pacing signals to the heart, as set forth in amended independent claim 9. Lastly, Tarjan fails to teach that a switch to activate the auxiliary module to generate the fixed-mode pacing signals when the sensing means determines that the signal from said signaling means indicates that the auxiliary module should activate, as set forth in amended independent claim 9.

Therefore, Tarjan fails to anticipate the invention as set forth in amended independent claim 9.

With respect to dependent claim 10, the Applicant, for the sake of brevity, will not address the reasons supporting patentability for this individual dependent claim, as this claim depends directly from allowable independent claim 9 for the reasons set forth above. The Applicant reserves the right to address the patentability of this dependent claim at a later time, should it be necessary.

Accordingly, in view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw this rejection under 35 U.S.C. §102(b) over Tarjan.

**II. Rejection of Claims 1, 2, 4, 5, and 6 under 35 U.S.C. §102(e) over Connelly**

Claims 1, 2, 4, 5, and 6 have been rejected under 35 U.S.C. §102(e) as being anticipated by Connelly (US 2002/0038135). This rejection of claims 1, 2, 4, 5, and 6 under 35 U.S.C. §102(e) over Connelly is respectfully traversed.

As respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the Applicant conceived or invented the subject matter, which was disclosed but not claimed in published US Patent Application Number US 2002/0038135 filed by the Applicant and others, as claimed in originally presented claims of the above-identified application.

Moreover, as respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the Applicant is the sole inventor of the subject matter, which was disclosed but not claimed in published US Patent Application Number US 2002/0038135 filed by the Applicant and others, as claimed in originally presented claims of the above-identified application.

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Lastly, as respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the subject matter, corresponding to the originally presented claims of the above-identified application and disclosed in Published US Patent Application Number US 2002/0038135, was derived from the Applicant.

Therefore, in view of the statements made in the attached Affidavit under 37 C.F.R. 1.132, Connelly is not a valid prior art reference under 35 U.S.C. §102(e) because the claimed invention corresponding to the originally presented claims of the above-identified application and disclosed by Connelly is not by another.

Accordingly, in view of the attached Affidavit under 37 C.F.R. 1.132 and remarks, the Examiner is respectfully requested to reconsider and withdraw this rejection under 35 U.S.C. §102(e) over Connelly.

**III. Rejection of Claims 12 and 13 under 35 U.S.C. §103 over Mulier in view of Nappholz et al.**

Claims 12 and 13 have been rejected under 35 U.S.C. §103 as being unpatentable over Mulier (US-A-3,718,142) in view of Nappholz et al. (US-A-5,766,227). This rejection of claims 12 and 13 under 35 U.S.C. §103 over the teachings of Mulier in view of Nappholz et al. is respectfully traversed.

As respectfully submitted above, amended independent claim 12 sets forth a cardiac assist system, comprising a primary device housing, the primary device housing having a control circuit therein; a shielding formed around the primary device housing to shield the primary device housing and any circuits therein from electromagnetic interference; a lead system to transmit and receive signals between a heart and the primary device housing; a switch to place the control circuitry into a fixed-rate mode of operation; and a detection circuit to detect a phase timing of an external magnetic resonance imaging pulse field. The switch causes the control circuit to be placed into a fixed rate mode of operation when the detection circuit detects the phase timing of an external magnetic resonance imaging pulse field so as to avoid interfering with the detected external magnetic resonance imaging pulse field.

Moreover, as respectfully submitted above, amended independent claim 13 sets forth a cardiac assist system, comprising a primary device housing, the primary device housing having a control circuit therein; a shielding formed around the primary device housing to shield the

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primary device housing and any circuits therein from electromagnetic interference; a lead system to transmit and receive signals between a heart and the primary device housing; a switch to place the control circuitry into a fixed-rate mode of operation; and a detection circuit to detect a phase timing of an external magnetic resonance imaging pulse field. The switch causes the control circuit to turn-off and cease operation when the detection circuit detects the phase timing of an external magnetic resonance imaging pulse field so as to avoid interfering with the detected external magnetic resonance imaging pulse field.

In formulating the present rejection under 35 U.S.C. §103, the Examiner alleges that Mulier teaches all of the subject matter of the above claims except the detection circuit to detect a phase timing of an external electromagnetic field. To meet this deficiency in the teachings of Mulier, the Examiner proposes to modify Mulier with the teachings of Nappholz et al. The Examiner alleges that Nappholz et al. teaches EMI detection in a pacemaker. From these allegations, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to have such a detection circuit in the device of Mulier in order to further prevent externally produced EMI from interfering with the operation of the pacemaker. These positions by the Examiner are respectfully traversed in view of the claims presented above.

As noted above, the Examiner recognizes that Mulier fails to teach the detection of a phase timing of an external magnetic resonance imaging pulse field. Moreover, with respect to the teachings of Nappholz et al. teaches the detection, by a pacemaker, of noise generated by microwave ovens and the such. Nappholz et al. fails to teach or suggest the detection of a phase timing of an external magnetic resonance imaging pulse field, as set forth in amended independent claims 12 and 13. Moreover, Nappholz et al. fails to teach or suggest that the control circuit alters its operations to avoid interfering with the detected external magnetic resonance imaging pulse field, as set forth in amended independent claim 12, or to turn-off and cease operation to avoid interfering with the detected external magnetic resonance imaging pulse field, as set forth in amended independent claim 13.

Therefore, Mulier and Nappholz et al., singly or in combination, fail to teach or suggest, as set forth in amended independent claims 12 and 13:

- 1) the detection of a phase timing of an external magnetic resonance imaging pulse field;
- 2) the control circuit alters its operations to avoid interfering with the detected external magnetic resonance imaging pulse field; and/or

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3) the control circuit turns OFF and ceases operation to avoid interfering with the detected external magnetic resonance imaging pulse field.

Accordingly, in view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw this rejection under 35 U.S.C. §103 over Mulier in view of Nappholz et al.

**IV. Rejection of Claims 3, 7, 8, and 11 under 35 U.S.C. §103 over Connelly**

Claims 3, 7, 8, and 11 have been rejected under 35 U.S.C. §103 as being unpatentable over Connelly (US 2002/0038135). This rejection of claims 3, 7, 8, and 11 under 35 U.S.C. §103 over Connelly is respectfully traversed.

As respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the Applicant conceived or invented the subject matter, which was disclosed but not claimed in published US Patent Application Number US 2002/0038135 filed by the Applicant and others, as claimed in originally presented claims of the above-identified application.

Moreover, as respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the Applicant is the sole inventor of the subject matter, which was disclosed but not claimed in published US Patent Application Number US 2002/0038135 filed by the Applicant and others, as claimed in originally presented claims of the above-identified application.

Lastly, as respectfully submitted in the attached Affidavit under 37 C.F.R. 1.132, the subject matter, corresponding to the originally presented claims of the above-identified application and disclosed in Published US Patent Application Number US 2002/0038135, was derived from the Applicant.

Therefore, in view of the statements made in the attached Affidavit under 37 C.F.R. 1.132, Connelly is not a valid prior art reference under 35 U.S.C. §102(e) because the claimed invention corresponding to the originally presented claims of the above-identified application and disclosed by Connelly is not by another.

Accordingly, in view of the attached Affidavit under 37 C.F.R. 1.132 and remarks, the Examiner is respectfully requested to reconsider and withdraw this rejection under 35 U.S.C. §103 over Connelly.

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**CONCLUSION**

Accordingly, in view of all the amendments and reasons set forth above, the Examiner is respectfully requested to reconsider and withdraw all the present rejections. Also, an early indication of allowability is earnestly solicited.

Respectfully submitted,



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